

REMARKS

Applicants, their principal representatives in Germany, and the undersigned have carefully reviewed the first Office Action of December 28, 2007 in the subject U.S. patent application, together with the prior art cited and relied on in the rejections of the claims. In response, the Substitute Specification and claims have been amended. It is believed that the claims now pending in the subject U.S. patent application are allowable over the prior art cited and relied on in their rejections. Reexamination and reconsideration of the application, and allowance of the claims is respectfully requested.

In the review of the Substitute Specification, in the course of the preparation of the subject Amendment, it was noted that ¶ 007 of the Substitute Specification does not include several sentences that were proposed, in the marked-up copy of the Specification, to be added to the verified translation of the German application. These several sentences were clearly intended to be added, as noted by their underlining in the marked-up copy. Their inadvertent omission from the Substitute Specification was unintended. Their addition at this time does not constitute any new matter. These sentences were proposed to be added in the marked-up copy. They are the importation into the Substitute Specification of the characteristics of claims 1, 3 and 5, as was recited in the German language document. Their entry, at this time, is respectfully requested.

The review of the Substitute Specification also noted several minor errors in typing and grammar. These are also being corrected and raise no issues of new matter.

As is set forth in the Substitute Specification, as depicted in the sole sheet of drawings, and as recited in currently amended claims 55 and 57, the subject invention is directed to a device for controlling register in a printing press, and in the case of claim 57, also controlling color density. This is done by providing at least one printing group having at least one forme cylinder, one transfer cylinder and one counter-pressure cylinder. The at least one printing group is usable for imprinting a multiple color image onto an imprinting substrate that is moving

in a substrate direction of travel. An image sensor is adapted to record a multiple color image of a width of the imprinting substrate in a direction that is transverse to the direction of substrate travel. The image sensor also generates data that is correlated with the image being printed on the imprinting substrate.

The image data from the image sensor is sent to an evaluating unit which receives the image data from the multiple color image printed during the running production of the printing press. The evaluating unit also receives reference data for a previously recorded multiple color image. The evaluation unit is adapted to separate both the running production multiple color image data and the previously printed or generated multiple color reference data into color separations. The evaluation unit can then perform a selective positional determination of the color separations. The color separations are then usable to provide control commands to a system regulating drive mechanism. In claim 55, that drive mechanism is a forme cylinder drive mechanism that is able to be controlled separately from the drive of the cooperating counter-pressure cylinder. Claim 55 also recites that the source of the previously recorded multiple color reference is a pre-printing stage that is located upstream, in the direction of substrate travel. Claim 57 further includes the recitation of an ink supply and an ink supply drive mechanism. The evaluating unit utilizes the differences detected between the running production image and the previously generated reference image to generate actuating commands for the ink supply drive. In both of the claimed embodiments, the evaluating device is used to control registration of the color image.

In the Office Action of December 28, 2007, claims 55-63, 65-67, 71-80, 85, 90, 92, 93 and 97-103 were rejected under 35 USC 102(b) as being anticipated by U.S. patent No. 5,412,577 to Sainio. Claim 64 was rejected under 35 USC 103(a) as being unpatentable over Sainio and further in view of U.S. patent No. 6,050,192 to Kipphan. Claims 69-70 and 84 were rejected under 35 USC 103(a) as being unpatentable over Sainio in view of U.S. patent No. 6,810,813 to Chretienat. Claims 81-83 were rejected under 35 USC 103(a) as being unpatentable

over Sainio in view of a second U.S. patent to Sainio, No. 6,796,240. Claims 91 and 94-96 were rejected under 35 USC 103(a) in view of Sainio '577.

The primary reference to Sainio, U.S. patent No. 5,412,577 is directed to a color registration system for a printing press. As may be seen in Fig. 1, four print units 14, 16, 18 and 20 are used to print a multiple color image on a web 12. A print controller 30 serves as an interface between a computer 32 and the several printing units 14, 16, 18 and 20. The controller 30 converts signals from the computer 32 into signals that are applied to the several printing units. The signals provided by the controller 30 are used to control the colors printed by the unit 14, 16, 18 and 20 such that these colors are properly registered.

As discussed in the Sainio reference, starting at line 3 of Column 5, the system 10 for printing a multi-color image on the web 12 includes a camera positioning unit 34 that is usable to control a camera assembly 36 and a printing plate scanner 38. The camera assembly 36 can be a properly configured color camera having four outputs. The purpose of the camera positioning unit 34 is to allow the camera assembly 36 to be moved in longitudinal and lateral direction with respect to the web. The purpose of the positioning assembly 34 is to allow selective scanning of positions of a suitable image which are suitable for registration, as recited at the top of Column 6 of Sainio '577.

The camera assembly 36 is used in cooperation with a plate scanner 38, as depicted in Fig. 1. The plate scanner 38 operates to scan each printing plate that is associated with the printing of a particular printed image, as recited at Column 6, lines 22-26.

The first step in the process disclosed in the Sainio '577 reference is the scanning of each of the four printing plates that will produce the four separate components of the color image. The camera of the plate scanner 38 is moved both longitudinally and laterally to view a plurality of image scan areas 68 of each of the four individual color plates. After the printing plates have been scanned, they are attached to the plate cylinders. The printing press is put into

operation and the camera assembly 36 is controlled to scan the printed image formed by the various plates which were previously scanned by the plate scanner 38.

During the scanning of the printed image, scanning positions of the camera 36 are determined based on image areas that were established during scanning of the plates. Note the discussion at Column 8, lines 58-68 of the Sainio patent. The comparison that is done in the Sainio reference is the comparison of data generated by the scanning of the printing plates, prior to their attachment to the forme cylinder with the printed image that they form on the substrate being printed.

Claim 55, as amended, recites that the evaluating unit is adapted to receive data of a multiple color printed image that has been recorded during the running production of the printing press. The evaluating unit compares that running production data with reference data of a previously recorded multiple color printed reference image. The evaluating unit is adapted to separate the running production multiple color printed image into color separations. The evaluating unit also performs a color separation on the previously recorded multiple color reference images. Once both of the color separations have been accomplished, the evaluating unit performs a relative position determination of the two color separations.

The Sainio patent does not utilize a similar evaluating unit and operation. In Sainio, the four colors of the printed image are each separately scanned, as discussed at the top of Column 9. These scanned images are compared with the scanned images of the printing plates. There is no comparison, in Sainio, of a multiple color printed image, taken from running production, with a multiple color reference printed image. In Sainio there is no color separation of the multiple color images in the evaluation unit. In Sainio, there is no relative position comparison of the color separation.

The assertion, in the Office Action, that Sainio does an equivalent evaluation, by referring to Column 10, lines 22 and 23 of Sainio is not correct. There is no disclosure, in the reference, of the performing of a selective positional determination of the running production

printed image with the reference multiple color printed image. There is no determination in the reference of where the color separations of the production image and of the reference image are located, with respect to each other.

In the subject invention, as recited in currently amended claim 55, the forme cylinder drive mechanism is adapted to be controlled separately from a drive mechanism for the counter-pressure cylinder that is assigned to that forme cylinder. An actuator is provided for the forme cylinder drive mechanism and is responsive to an actuating command generated by the evaluating unit. That actuating command is applied to the forme cylinder drive to regulate a registration of the forme cylinder in response to the data comparison generated in the evaluating unit.

In the Office Action, it was asserted that Sainio '577, at Column 5, lines 15-17 discloses the provision of a forme cylinder drive mechanism adapted to separately control the forme cylinder with respect to the associated counter-pressure cylinder. In fact, Sainio merely recites that the positioning of the cylinders 22, 24, 26 and 28 can be controlled relative to the moving web. This does not mean that each plate cylinder 24 is provided with a drive mechanism that is adapted to be controlled separately from a drive mechanism for an associated counter-pressure cylinder, such as cylinder 26. In fact, there are various known drive mechanisms, such as helically splined gear sets that allow positioned adjustment of a forme cylinder, with respect to its associated counter-pressure cylinder, which do not meet the limitations of currently amended claim 55.

The Office Action asserts that Sainio '577 discloses a pre-printing stage located upstream in the direction of travel of the substrate as the plate scanner 38. In fact, the plate scanner 38 does not provide a pre-printing stage where reference data of a previously recorded multiple color printed reference image is provided. In Sainio, the printing plate scanner 38 is usable to scan each printing plate before it is attached to its respective forme cylinder. There is no discussion of the location of the plate scanner. More importantly, the plate scanner 38 scans

each printing plate. It does not scan an image that was produced in a pre-printing stage. As that term is defined in the specification of the subject U.S. application, the pre-printing stage is a location where the color locations of the image have been properly adjusted, either manually or automatically, so that all of the colors are correctly positioned with respect to each other. In this regard, the Examiner is requested to note the discussion at ¶ 028 of the Substitute Specification of the subject application. In Sainio, there is no evaluation of a multiple color printed reference image. Instead, images of the separate printing plates, which will cooperate to form the multiple color production image, are scanned. The Sainio reference does not disclose the provision of a color separation of the reference image and the locational comparison of that color separation with a color separation of the production image, all as recited in currently amended claim 55.

Claim 55, as filed, and even more clearly as amended, is not anticipated by, or obvious over the Sainio '577 reference. The rejection of claim 55 is based on conclusions regarding the asserted teachings of the reference which are not correct, based on a careful reading of the reference. Claim 55, as amended, is believed to patentably define the subject invention over the Sainio '577 reference.

Turning now to the rejection of independent claim 57, it is noted that the assertion regarding the Sainio '577 reference being able to perform a color separation of the multiple color printed image and of a previously generated multiple color printed reference image is not supported by the language relied on in the Office Action. In Sainio '577, at Column 10, lines 22 and 23 there is set forth the statement that the computer 32 performs a color conversion by multiplying a color separation matrix with the RGBI density data vector for each pixel from the reference area. The referenced color conversion is discussed in the preceding paragraph which discusses the conversion of analog image data from the cameras into digital image data. This RGBI digital data is then converted to CMYK on-press image data by the computer 32. This is the color conversion referred to at lines 22 and 23 of Column 10. It is not a color separation of a

multiple color running production printed image and the color separation of a multiple color reference printed image, as recited in currently amended claim 57.

The rejection of claim 57, as anticipated by the Sainio reference is also not correct with respect to the use of the evaluating unit to perform a relative positional determination of the image data. In Sainio '577, as was discussed in connection with the rejection of claim 55, the printed image is scanned by four separate cameras which each record a separate color image. These recorded separate color images are compared with the physical structures of the four printing plates which were used to print the color images. This is not the same as taking a multiple color image printed during running production; separating it into color separations; taking a multiple color printed reference image; separating it into color separations and using these color separations to determine relative positions of the several colors.

It is not contested that the Sainio '577 reference must have some type of ink supply. The nature or structure of that ink supply is not disclosed in the reference. Neither is there any disclosure of means in the computer 32 of Sainio to correct differences detected by the relative positional determination into actuating commands for the ink supply drive mechanism and for the register regulating drive mechanism. The rejection includes a plurality of statements that a disclosed ability or procedure implies another ability or production which, in fact is not disclosed or suggested. The Sainio '577 reference thus does not anticipate the structure recited in currently amended claim 57 of the subject application.

All of the remaining claims now pending in the subject application depend, either directly or indirectly from believed allowable independent claims 55 or 57. The secondary references relied on to show the features of these claims, which are not shown or suggested in the primary Sainio '577 reference, do not provide the teachings which are missing from the primary reference. These dependent claims are thus also believed to be allowable.

The several additional references cited by the Examiner, but not relied on in the rejections of the claims, have been noted. Since they were not applied against the claims, no further discussion thereof is believed to be necessary.

SUMMARY

The Substitute Specification has been amended to correct several minor typographical errors and to add several sentences that were inadvertently not transferred from the marked-up copy of the verified translation. These changes do not constitute any new matter.


Independent claims 55 and 57 have both been amended. It is believed that these claims patentably define the subject invention over the prior art cited and relied on. The rest of the claims depend from one or the other of the two believed allowable independent claims, and are also believed to be allowable.

Allowance of the claims, and passage of the application to issue is respectfully requested.

Respectfully submitted,

Stefan Arthur BUDACH et al.
Applicants

JONES, TULLAR & COOPER, P.C.
Attorneys for Applicant



Douglas R. Hanscom
Reg. No. 26,600

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JONES, TULLAR & COOPER, P.C.
P.O. Box 2266 Eads Station
Arlington, Virginia 22202
(703) 415-1500
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